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Dear Sir:

A $4 million nuclear research and development center is projected for Cleveland by Case Institute of Technology and a number of Ohio inudstrial firms. Firms in the group, which is now investigating the building and operating of such a center, include Republic Steel Corp.; Thompson Products, Inc.; Cleveland Electric Illuminating Co.; Austin Co.; and Standard Oil Co. of Ohio. T. Keith Glennan, Case president, said he expects other Ohio firms to take an interest in the project. (Other NUCLEAR PROJECT news, p. 4 this LETTER.)

High purity thorium in crystal bar form is now being produced by Metal Hydrides, Inc., at its pilot plant in Beverly, Mass. Under its present limited production, the firm is accepting orders for the metal in quantities up to 10-lbs. Larger production facilities are planned, based on experience with the pilot plant which uses an iodide process recently developed by the company in cooperation with Battelle Memorial Institute. (Other PRODUCT, PROCESS, INSTRUMENT news, p. 4 this LETTER.)

Seventy million dollar mine development program of Northspan Uranium, Canadian unit of Rio Tinto, aimed at establishing production by the beginning of next Summer, is showing progress at the 4 mines being developed. At the Lake Nordic mill, production start-up is planned for July at the 4,000-ton installation; at the Spanish American mill, a 2,000-ton unit, start-up is scheduled for August; and at the 3,000-ton Panel Consolidated plant, start-up is planned for September. In addition, Northspan's Buckles mine will use the Spanish mill, initially. (Northspan holds sales contract from Eldorado Mining & Refining, Canadian government purchasing agency, for $275 million worth of uranium concentrates. When contract was arranged, estimated ore total of the four mines was put at 30 million tons averaging a little better than 2.0-lbs. of uranium oxide per ton. Officials of Northspan now feel, however, that less than 50% of the presently indicated and potential ore will be consumed during the life of the contract.) (Other RAW MATERIAL news, p. 2.

Contract to construct an actuator facility at the national reactor testing station, Idaho Falls, has been awarded Erhardt Dahl Anderson, Pocatello, Idaho, by the USAEC's Idaho Falls office, Structure will be erected in the aircraft nuclear propulsion area of the testing station. Award to Anderson was on basis of low bid among six received for the job.

Three of seven proposals to develop, build and operate small nuclear power plants were rejected by the USAEC as not acceptable for its help in its program of power reactor development. Rejected proposals had been submitted by the cities of Holyoke, Mass., and Orlando, Fla., and also by the University of Fla., at Gainesville. Negotiations are in progress for varying forms of assistance on four other proposals submitted by: Rural Cooperative Power Assoc., Elk River, Minn.; Wolverine Elec. Cooperative, Big Rapids, Mich.; Chugach Elec. Assoc., Anchorage, Alaska; and the City of Piqua, Ohio. (Other BUSINESS news, p. 2 this LETTER.)

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ATOMIC ENERGY BUSINESS NEWS:-

NUCLEAR POWER PLANT TO BE SUPPLIED ITALIAN FIRM:- Edison-Volta, S.p.A., Milan, Italy, will buy a 134,000 electrical kilowatt nuclear power plant from Westinghouse Electric International Co., in the largest export transaction in the nuclear power field to be concluded to date. Gibbs & Hill, New York, are consulting engineers in the transaction which must await intergovernmental and financial arrangements. The plant will be a duplicate of the one Westinghouse is to build in Rowe, Mass., for Yankee Atomic Electric Co., a group of New England utilities. That plant is expected to cost about $34.5 million, with the USAEC contributing about $5 million. According to Charles Weaver, Westinghouse vice president in charge of that firm's nuclear work, the company expects to break even on the transaction. The basic cost of the Italian plant will be roughly similar to the Yankee installation, he observed, with the reactor of the pressurized water type. Mr. G. Valerio, managing director of the Italian concern, said he hoped the Italian reactor could be in operation soon after the Yankee plant's scheduled 1959 start-up.

U.S. NAVY TO BUILD ONLY NUCLEAR POWERED SUBMARINES:- Next year's Naval budget will have only nuclear power plants in construction proposals for underseas craft, the Navy's Bureau of Ships chief, R/Admr. Albert G. Mumma said last fortnight in Washington. This will continue present policy, as current navy budget has no items for conventional type submarines. He said that new nuclear powered submarines would probably cost the Navy an average of $60 million each; this will be less than the Nautilus, the first one, which cost $67 million. (Nautilus, which has cruised 60,000 nautical miles, will shortly have first uranium change made in its nuclear reactor, when contaminated fuel material will be removed and the reactor refueled. Meanwhile Westinghouse Electric, manufacturer of the Nautilus plant, is working on propulsion plants for 12 additional nuclear submarines.)

Admr. Numma also gave the first authoritative estimates of the cost of the Navy's first nuclear powered aircraft carrier which Congress will be asked to authorize at its new session (which got underway last week). He placed the cost of this 85,000 ton ship at about $300 million, or about 30 to 40 per cent more than the cost of a flattop of the Forrestal class which, powered conventionally, has cost about $200 million.

REACTOR TO SUPPLY ADDITIONAL POWER AT BRITISH NUCLEAR STATION:- Reactor no. 2 at the Calder Hall nuclear power station has gone critical, i.e., a sufficient quantity of the uranium fuel on which it operates has been loaded to enable a self sustaining chain reaction. After additional loading, and subsequent experimental work, this second reactor will be teamed up with the first. When both these reactors are operating on full power, they will have an installed capacity of 92 megawatts, of which 70 megawatts will be fed into the National grid for general consumption. Another power station of the same capacity is under construction at Calder Hall, and is scheduled for operation in 1958. (Calder Hall is the work of the U.K. Atomic Energy Authority, now building a similar station with four reactors at Annan in Dumfreishire, Scotland, due to start operating in 1959, and a fast breeder reactor at Dounreay in the North of Scotland, to start working in 1958. All these stations are entirely separate from the nuclear power programs of Britain's Central Electricity Authority and the South of Scotland Electricity Board.)

RAW MATERIALS...prospecting, mining, marketing...

UNITED STATES:- USAEC has now contracted to buy uranium concentrates output of mill to be erected in Ambrosia Lake district of New Mexico by Homestake-New Mexico Partners, of Santa Fe. First major uranium project in Ambrosia Lake area, the 750 tons per day mill will be built by Western Knapp Engineering Co., of San Francisco. Ore reserves of the group are placed at 1.3 million tons. (Homestake Mining Co. is general partner in the organization, and will finance, manage and operate the mill. Limited partners are Rio de Oro Uranium Mines, Inc.; United Western Minerals Co.; J. H. Whitney & Co.; White, Weld & Co.; San Jacinto Petroleum Corp.; and Mr. Clyde Osborn, former manager of Kerr-McGee Industries' uranium processing mill at Shiprock, N.M.)

CANADA:- Trade sources now estimate that Gunnar Mine's uranium production, in 1956, on a gross dollar basis, was over the $14 million mark. Normal production began in April, 1956, and for the nine month period ending Dec. 31, 1956 it is estimated that net profits (before write-offs) reached the $8 million level.

ATOMIC ENERGY FINANCIAL NEWS...

FUNDS IN NUCLEAR FIELD SHOW GAINS:- Total net assets of Science & Nuclear Fund, Philadelphia, on Dec. 31st, 1956 were $1,669,333 representing an increase of $728,300 for the year. Net asset value during the period increased from $10.76 to $11.73 per share. Major new additions to the Fund's portfolio during the year were Northspan Uranium Mines, Ltd., 5 3/4% bonds with warrants attached; Allegheny Ludlum 4% convertible debentures; National Research Corp. 5% convertible debentures; and common stocks of Climax Molybdenum, Kawecki Chemical, Newport News Shipbuilding, and Shell Oil. Major eliminations were Blaw-Knox, Combustion Engineering, Charles Pfizer, and Beryllium Corp.

Energy Fund, Inc., New York, mutual fund holding stocks of firms in energy industries including the nuclear, had assets of $3,042,296 on Dec. 21st, 1956 compared with $1,410,513 a year earlier. Shares outstanding during this period increased from 10,319 to 19,301 while asset value per share rose from $136.69 to $157.62.

URANIUM MINING NEWS:- Merger of Atlas Uranium Corp., and Bleak Uranium Co., western U.S. uranium mining firms, with Atlas the surviving firm, has been completed following recent approval of stockholders. One share of Atlas was issued for two shares of Bleak. Chairman of the Atlas board is Jack C. Burgess, Grand Junction, Colo., while A. A. Fisher, Los Angeles, is Atlas president. Officers of the firm feel the combined holdings will make for an improved profit picture.

Bonuses given uranium mining firms in the U.S., by the USAEC, in the 5-year period since the program began, have totalled $8,804,177, according to figures released. Payments were distributed among 729 mining properties in 11 states. Only state east of Mississippi river to participate was Pennsylvania, with one property receiving $3,938. Utah was leader with 260 properties receiving $2,891,189, followed by Colorado with 193 properties receiving $2,237,841, and Arizona where 98 properties received $1,299,223.

CHANGES IN STOCKHOLDINGS MADE:- Changes in holdings recently made by officers of listed firms in the nuclear field include sales by Kennard H. Morgenstern, vice president, Nuclear Corp. of America, Inc., of 600 common shares and 1,000 class A shares, leaving direct ownership of 600 common shares and 32,200 class A shares. At Holly Corp., firm with uranium mining holdings, Fred W. Fairman, Jr., director, bought 500 common shares making his direct holdings that amount.

NUCLEAR FIRMS SHOW INCREASED BUSINESS FOR YEAR:- High Voltage Engineering Corp., Cambridge, Mass., manufacturer of particle accelerators, is entering the new year with record backlog of orders around $5.5 million, up from $3.75 million a year ago. Firm also expects operating economies at its new $1,750,000 Burlington, Mass., plant where all operations will be concentrated early this year. Last year was most successful in 10 year history of the firm; with sales and net income some 40% above the $2,007,101 and $106,452, respectively, reported for 1955.

Vitro Corp. of America, New York, diversified nuclear firm, is understood to have current backlog of over $100 million. The company signed contracts in the nuclear field last year totaling about $50 million, more than $40 million of it for uranium milling. Heavy Minerals Corp., jointly owned by Vitro and Crane Corp., is also expected to contribute to Vitro's earnings.

IONIZING RADIATION...news & notes...

CONTINUOUS SURVEY TO BE CONDUCTED OF RADIOACTIVITY IN FOODS:- Continuous survey of the radioactivity present in selected foods produced in the U. S. has been started by Food and Drug Administration. Objectives are to determine the naturally occurring background radioactivity in staple foods from different geographic areas, and then to monitor these foods for any changes in radioactivity that might be caused by weapons testing and other applications of nuclear energy.

ABILITY TO WITHSTAND RADIATION VARIES WITH AGE, GROUP TOLD:- As man ages, his vulnerability to ionizing radiation increases, Henry A. Blair, director of a University of Rochester-USAEC research project told a symposium at the annual meeting of American Association for Advancement of Science in New York last week. The peak resistance of young adulthood to ionizing radiation drops by 25% at the age of 50, and upward of 75% within an additional 20 years, Dr. Blair explained. A large single dose of ionizing radiation effects life expectancy three times more strongly than repeated single doses, he observed.

NEW PRODUCTS, PROCESSES, INSTRUMENTS...in the nuclear field...

PRODUCTS FROM MANUFACTURERS:- Automatic radioactive chromatograph scanner is designed to provide an accurate graphical presentation of the activity distribution along a paper chromatogram tagged with low energy beta-emitting isotopes. Small flow counter with low background is used; chromatograms up to 3-in. width and 5-ft. length can be accommodated. --Forro Scientific Co., 833 Lincoln St., Evanston, Ill.

MANUFACTURERS PLANS:- Expansion of production of its Irrathene irradiated polyethylene is planned by General Electric Co. at its newly constructed facilities at Pittsfield, Mass. Its present semi-works capacity of 300,000-lbs. per year will be increased by new facilities to 1.6 million-lbs. annually, with an eventual expansion to 3.2 million lbs. per year. (Using electron accelerators, with a polyethylene resin modified by addition of antioxidants, G-E has been producing for some 2½ years this polyethylene which has improved strength and heat resistance.)

New radiation counters which it expects to place on the market this Spring should continue the good profit picture it has been showing, officials of Nuclear-Chicago Corp., Chicago nuclear products concern, believe. Company also hopes to expand sales of its tagged radiochemicals, about half of which now go to industrial users, with the balance to biological and medical research workers. (From an after tax loss in 1953, firm's earnings after taxes rose to $19,000 in 1954; $110,000 in 1955; and to $180,000 for fiscal 1956. Corporate health is credited by the trade to financial expert E. B. Tilton who took over three years ago; new head is now James Phelan, who worked under Tilton to build up sales of the company's instruments.)

NOTES:- Commercial department has been set up by the U. K. Atomic Energy Authority to handle sales of uranium, plutonium, thorium, graphite and other similar materials for the Authority, and will set terms and conditions of sale as well as the selling prices. Manager is W. P. Warren who may be addressed at Industrial Group Headquarters, U. K. Atomic Energy Authority, Risley, near Warrington, Lancs., England.

NUCLEAR REACTOR NEWS...

NEW AIR FORCE RESEARCH REACTOR PLANNED:- A nuclear research reactor will be supplied by the U. S. Air Force to the Bell Telephone Laboratories, Whippany, N. J., to assist in an expanded Bell Labs physical research program. Bell Labs now has some 3,000 employees working at Whippany, primarily on Air Force and other military contracts. (Air Force also plans to supply a 3 mev Van De Graaff machine to these laboratories.) The reactor will be similar to the one now being built at Massachusetts Institute of Technology by ACF Industries that will produce between 5,000 and 10,000 KW of heat energy.

REACTOR CONSTRUCTION PERMITS TO BE ISSUED:- Two notices of intention to issue construction permits for nuclear research reactors have been posted by the USAEC. One will be to AMF Atomics, Inc., New York, for a pool-type research reactor on a 300-acre site near Princeton, N. J. AMF Atomics will build the reactor, but its ownership will eventually be shared by a group of industrial concerns associated under the name of Industrial Reactor Laboratories, Inc. Estimated cost of the facility is about $2.7 million, with annual operating budget of about $500,000.

Second construction permit will go to Westinghouse Electric Corp. for a test reactor at a facility in Westmoreland County, Pa., about 29 miles southeast of Pittsburgh. The reactor, which will be cooled and moderated by ordinary water under pressure, will use enriched uranium and will be capable of generating 20,000 kw of heat energy. Westinghouse said it plans to use the reactor to develop and test power reactor fuel elements, to test radiation damage to materials and components, and to produce radioisotopes in limited quantities.

PEOPLE...in atomic energy work...

Lyman A. Bliss has been appointed president of Union Carbide Nuclear Co., div. of Union Carbide & Carbon Corp. Mr. Bliss succeeds Kenneth Rush, a vice-president of UCC&C.

Boris Pregel, president, Canadian Radium & Uranium Corp., New York, has been elected president of the New York Academy of Sciences for 1957.

William Greenfield has been appointed treasurer of Tracerlab, Inc., Boston nuclear products firm. Mr. Greenfield was formerly treasurer George E. Keith Co.

W. R. Kanne has been named manager of the newly established advanced development activity at General Electric-operated Knolls Atomic Power Laboratory, Schenectady, N. Y.

NEW BOOKS & OTHER PUBLICATIONS...on nuclear subjects...

Nuclear Notes for Industry; Issue of Dec. 14, 1956. Guide to USAEC-developed unclassified information of special industrial interest. --USAEC, Oak Ridge, Tenn.

Facts Concerning Uranium Exploration & Production, by John E. Crawford, James Pacne. Handbook of exploration. 130 pages. --Sup't. of Docs., Wash. 25, D.C.

Some Effects of Ionizing Radiation on Human Beings. Study of accidental deposit of radioactive material on inhabited Pacific islands following detonation of thermonuclear device (hydrogen bomb). 106 pages. Cat. No. Y 3.At 7:22/TID-5358. --Sup't. of Documents, Wash. 25, D. C. ($1.25)

Gamma Irradiation of Germanium & Silicon Transistors, by Ralph J. Panos. Experimental work at electronic components laboratory, Wright Air Development Center, Dayton, Ohio. 110 pages. No. PB-121490. --Office of Technical Services, Wash. 25, D.C.

Design Description of the Dresden Nuclear Power Station. Paper presented at annual meeting, American Society of Mechanical Engineers, Nov. 26, 1956, by General Electric Co. engineers. Bulletin no. GER 1301. --Apparatus Sales Div., General Electric Co., Schenectady, N. Y.

ATOMIC ENERGY PATENT DIGEST...

PATENT GRANTS TO PRIVATE INDIVIDUALS AND/OR ORGANIZATIONS:- Radiation sensing device utilizing selenium in vitreous form. U. S. Pat. No. 2,774,887 issued Dec. 18, 1956; assigned to The Haloid Co., Rochester, N.Y. (Application date: Aug. 13, 1952.) (Inventors: R. C. McMaster, M. D. Phillips.)

Means for collecting and utilizing electrical energy of nuclear transformations (radioactive battery). U. S. Pat. No. 2,774,891 issued Dec. 18, 1956; assigned to Universal Winding Co., Cranston, R. I. (Application date: Nov. 23, 1954). (Inventors: E. J. Dziedziula, H. C. Lieb.)

Method of geophysical exploration by radioactivity detection. U. S. Pat. No. 2,775,710 issued Dec. 25, 1956; assigned to Texaco Development Corp., New York. Application date: Feb. 21, 1952.) (Inventor: C. G. Ludeman.)

Method of concentrating fissionable material, i.e., concentrating plutonium values. U. S. Pat. No. 2,776,185 issued Jan. 1st, 1957 to Louis B. Werner, Bernard A. Fries, Glenn T. Seaborg. (Application date: April 12, 1945.)

Method of radioactivity well logging. U. S. Pat. No. 2,776,378 issued Jan. 1st, 1957; assigned to Well Surveys, Inc., Tulsa, Okla. (Application date: Jan. 26, 1951.) (Inventor: A. H. Youmans.)

Radiation detector tube. U. S. Pat. No. 2,776,390 issued Jan. 1st, 1957, to Nicholas Anton, Brooklyn, N.Y. (Application date: Nov. 17, 1953.)

PATENT GRANTS TO GOVERNMENTAL ORGANIZATIONS:- Pressure differential filtering apparatus. U.S. Pat. No. 2,774,479 issued Dec. 18, 1956; assigned to United States of America (USAEC). (Application date: Jan. 5, 1945.) (Inventor: R. Cummings.)

Remote control manipulator. U. S. Pat. No. 2,774,488 issued Dec. 18th, 1956; assigned to United States of America (USAEC). (Application date: June 17, 1955.) (Inventors: R. C. Goertz, R. G. Schmitt, Jr., R. A. Olsen, R. B. Wehrle.)

Method of recovering metallic uranium from uranium halides. U. S. Pat. No. 2,774,729 issued Dec. 18, 1956; assigned to United States of America (USAEC). (Application date: Jan. 31, 1944.) (Inventor: G. Meister.)

Air-cooled nuclear reactor with flattened activity curve. U. S. Pat. No. 2,774,730 issued Dec. 18, 1956; assigned to United States of America (USAEC). (Application date: Sept. 5, 1944.) (Inventor: Gale J. Young.)

Gas transfer pump with mercury bellows. U. S. Pat. No. 2,775,399 issued Dec. 25, 1956; assigned to United States of America (USAEC). (Application date: Aug. 19, 1955.) (Inventors: E. S. Robinson, A. C. Briesmeister, B. B. McInteer.)

Continuous electrolytic process for reducing uranium in solution. U. S. Pat. No. 2,775,552 issued Dec. 25, 1956; assigned to United States of America (USAEC). (Application date: Sept. 10, 1945.) (Inventor: R. Q. Boyer.)

Millivolt gating circuit. U. S. Pat. No. 2,775,696 issued Dec. 25, 1956; assigned to United States of America (USAEC). (Application date: July 14, 1953.) (Inventor: R. E. Thomas.)

Sincerely,

The Staff,
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